SB761
.U7
I54
1986

ed States
artment of
culture

st
Service

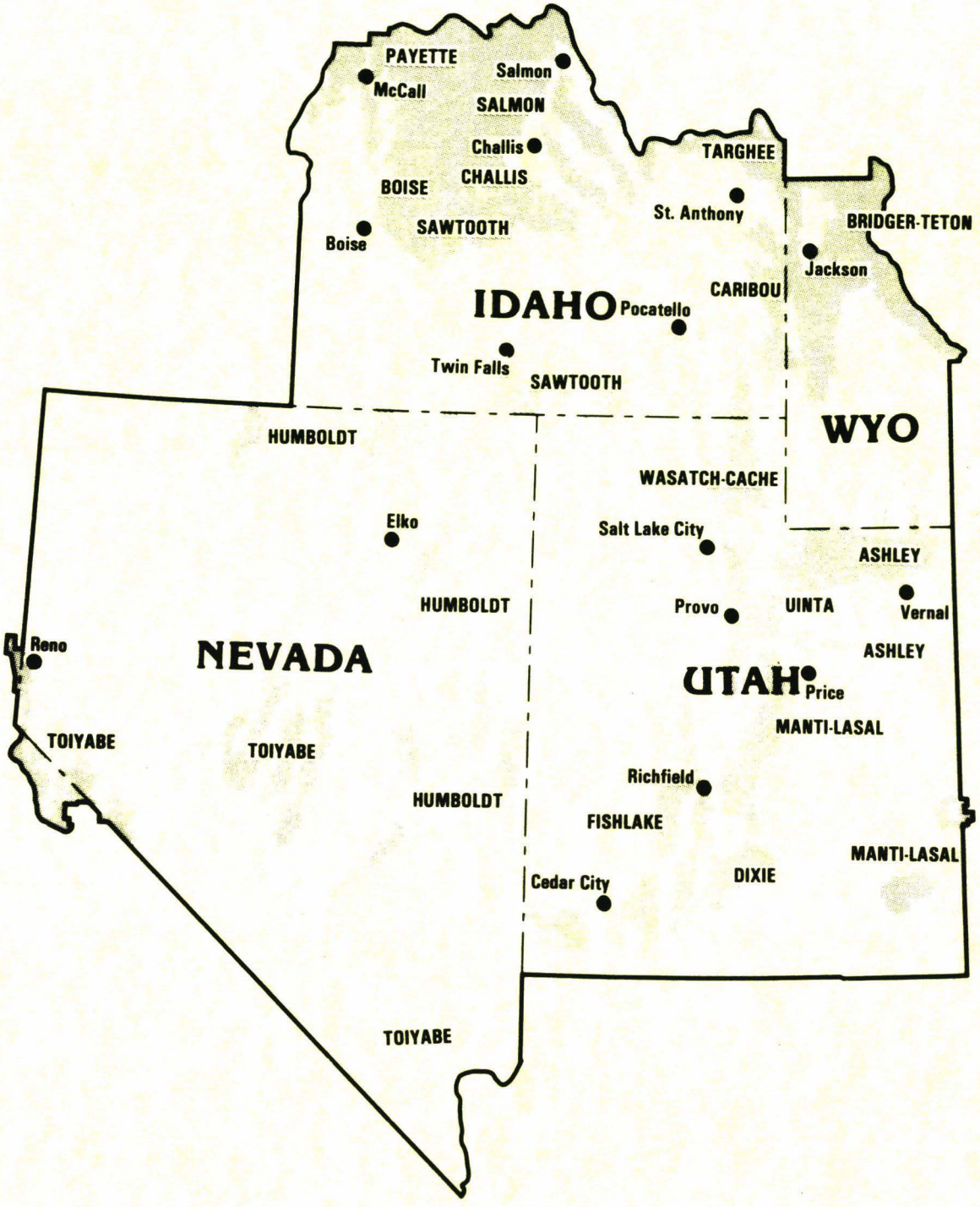
Intermountain
Region

Ogden, Utah

Forest Insect and Disease Conditions

Intermountain Region

1986



United States
Department of
Agriculture

Forest
Service

Intermountain
Region

Ogden, Utah

Forest Insect and Disease Conditions

Intermountain Region

1986

FOREST INSECT AND DISEASE CONDITIONS

Intermountain Region
1986

Compiled by:

J. Hoffman
A. Knapp
J. Weatherby

Forest Pest Management
State and Private Forestry
USDA Forest Service
Intermountain Region
324 25th Street
Ogden, Utah 84401

FOREST PEST MANAGEMENT
INTERMOUNTAIN REGION

Regional Office
324 25th Street
Ogden, Utah 84401
(801) 625-5257
FTS 586-5257

David G. Holland	Group Leader
Garth Baxter	Program Manager/ Pesticide Coordinator

Ogden Field Office
324 25th Street
Ogden, Utah 84401
(801) 625-5458
FTS 586-5458

Vacant	Ogden Field Office Representative
John A. Anhold	Entomologist
Borys M. Tkacz	Plant Pathologist
Ann M. Keysor	Biological Technician

Boise Field Office
1750 Front Street, Room 202
Boise, Idaho 83702
(208) 334-1345
FTS 554-1345

Ralph E. Williams	Plant Pathologist/Boise Field Office Representative
Ralph W. Thier	Entomologist
Julie C. Weatherby	Entomologist
James T. Hoffman	Plant Pathologist
K. Andrew Knapp	Biological Technician
Sharon Rees	Secretary

TABLE OF CONTENTS

Subject **Page**

Resumé of Conditions 1

ENTOMOLOGY

Bark beetles
- Mountain pine beetle 2
- Spruce beetle 2
- Douglas-fir beetle 2
- Pine engraver beetle 3
- Western pine beetle 3
- Jeffrey pine beetle 3

Defoliators
- Western spruce budworm 8
- Sugar pine tortrix/Pine needle sheathminer 8
- Douglas-fir tussock moth 8
- Gypsy moth 8

Miscellaneous insects
- Locust borer 8
- Scarab beetle 8
- Spruce bud scale 8

Summary of insect conditions 12

PATHOLOGY

Stem and branch diseases
- Dwarf mistletoes 14
- Pinyon blister rust 14
- Thyronectria canker 15

Root diseases
- Annosus root disease 15
- Armillaria root disease 15
- Black stain root disease 15
- Tomentosus root disease 15
- Schweinitzii butt rot 16

Foliage diseases
- Douglas-fir needle cast 16
- Marsonnina blight 16

Vascular wilts
- Dutch elm disease 16

Abiotic
- Hail damage 16
- Snow damage 16

Summary of disease conditions 17

Recent publications 20

RESUMÉ OF CONDITIONS

Tree mortality caused by the mountain pine beetle increased from 998,157 trees in 1985 to 1,512,057 trees in 1986. Significant infestations occurred on the Ashley, Bridger-Teton, Boise, Caribou, Sawtooth, and Wasatch-Cache National Forests.

The spruce beetle continued to cause extensive mortality on the Payette National Forest, with approximately 12,600 infested trees detected. Smaller infestations are scattered throughout the Region.

Defoliation by the western spruce budworm increased from 2.9 million acres in 1985 to 3.1 million acres in 1986. Infestations increased in size and intensity on the Boise, Caribou, Dixie, Payette, Salmon, Sawtooth, and Wasatch-Cache National Forests. Infestations decreased on the Bridger-Teton, Challis, Fishlake, and Targhee National Forests.

Douglas-fir beetle activity increased in 1986 killing 6,237 trees. Tree mortality increased on the Boise, Caribou, Sawtooth, and Wasatch-Cache National Forests; and decreased on the Bridger-Teton National Forest.

Defoliation of lodgepole pine by the sugar pine tortrix decreased from 14,250 acres in 1985 to 1,500 acres in 1986 on the Bridger-Teton National Forest.

Pine engraver beetle activity increased in southern Idaho killing 2,402 trees.

Armillaria root disease surveys detected infection centers up to 600 feet in diameter in a spruce-fir stand on the Manti-LaSal National Forest in Utah.

Aspen defoliation by Marssonina blight and a variety of other pests was observed on the Targhee, Uinta, and Wasatch-Cache National Forests.

Dwarf mistletoe suppression projects removed infected overstory trees from 3,789 acres on 14 National Forests in the Region.

Pinyon blister rust, on single-leaf pinyon pine, was reported for the first time in Idaho.

Thyronectria canker on honeylocust was reported for the first time in Utah on an urban tree in Salt Lake City.

Adverse weather conditions caused damage in several areas. Hail defoliated a Douglas-fir stand in western Idaho. Heavy snow accumulation caused many avalanches in Utah resulting in extensive tree uprooting and breakage. In western Wyoming snow caused extensive leader deformity and breakage in a lodgepole pine plantation.

ENTOMOLOGY

BARK BEETLES

Mountain Pine Beetle, *Dendroctonus ponderosae Hopkins*

Tree mortality attributed to the mountain pine beetle increased from 998,157 trees killed in 1985 to 1,512,029 trees killed in 1986. The most devastating infestation continues to affect lodgepole and ponderosa pine stands on the Ashley and Wasatch-Cache National Forests in northeastern Utah. Tree mortality increased to 1,300,000 trees on the Ashley National Forest and 179,000 trees on the Wasatch-Cache National Forest. Mountain pine beetle activity was also detected on the Dixie, Manti-LaSal, and Uinta National Forests in Utah.

Mountain pine beetle activity remains static in southern Idaho with 18,000 lodgepole and ponderosa pines killed. Significant infestations are near Lost Basin and Trinity Creek on the Boise National Forest; in Caribou Basin on the Caribou National Forest; along Squaw Creek on the Challis National Forest; and in the Big Wood River Drainage and Sawtooth Valley on the Sawtooth National Forest. Some beetle activity was observed on the Payette, Salmon, and Targhee National Forests.

Mortality figures from the aerial detection surveys are displayed in Table 1. The status of infestations by State is displayed in Table 2. The location of the major infestations in the Region are shown in Figure 1.

Spruce Beetle, *Dendroctonus rufipennis* (Kirby)

Aerial and ground surveys detected 900 mortality centers with 14,000 fading spruce trees on the Payette and Boise National Forests in southern Idaho. Mortality was scattered on the McCall, New Meadows, and Council Ranger Districts of the Payette National Forest and on the Cascade Ranger District of the Boise National Forest.

Spruce beetle mortality was scattered throughout the spruce type in Utah with 210 trees killed within 30 mortality centers. On the Wasatch-Cache National Forest, heavy spring snows caused avalanches that uprooted Engelmann spruce causing a rapid increase in beetle populations.

Aggressive salvage and trap tree programs have minimized tree losses in accessible areas, while in remote areas infestations remain untreated.

Mortality figures from aerial detection surveys are displayed in Table 1.

Douglas-Fir Beetle, *Dendroctonus pseudotsugae* Hopkins

Tree mortality caused by the Douglas-fir beetle increased five-fold to 5,114 trees throughout southern Idaho. Beetle activity increased on all Forests except the Challis and Targhee National Forests. Activity was concentrated in the Shafer Butte area on the Boise National Forest, along McCoy Creek on the Caribou National Forest, throughout the Monroe Butte-Sturgill Peak area on the Payette National Forest and in the South Fork of the Boise River Drainage on the Sawtooth National Forest.

In Utah, Douglas-fir beetle continues to kill trees weakened from defoliation by western spruce budworm in Logan Canyon on the Wasatch-Cache National Forest. In western Wyoming, on the Bridger-Teton National Forest, beetle activity decreased from 4,500 trees killed in 1985 to 746 trees killed in 1986. Infestations persist in the Greys River, Hoback, and Buffalo Fork drainages. Mortality figures from aerial detection surveys are found in Table 1.

Pine Engraver Beetle, *Ips pini* (Say)

Pine engraver beetle activity increased significantly in southern Idaho with 2,400 ponderosa pines killed. Activity was observed in Boise Basin, Buck Canyon, and Trinity Creek on the Boise National Forest, along Calf Pen Creek and Lick Creek on the Payette National Forest, in the Granite Creek drainage on the Salmon National Forest, and near Featherville on the Sawtooth National Forest. Mortality figures from aerial detection surveys are found in Table 1.

Western Pine Beetle, *Dendroctonus brevicomis* LeConte

Western pine beetle and pine engraver beetle were observed in pole-size and larger ponderosa pine in the Boise Basin area near Idaho City, Idaho.

Jeffrey Pine Beetle, *Dendroctonus jeffreyi* Hopkins

Infestations of Jeffrey pine beetle caused mortality of Jeffrey pines on the Toiyabe National Forest in Nevada.

TABLE 1. Number of trees killed by bark beetles in Region 4 during 1985-86 as observed during aerial detection surveys.

Forest* (& Adjacent) Land)	Year	Mountain Pine Beetle	Trend	Douglas-Fir Beetle	Trend	Ips	Trend	Spruce Beetle	Trend
Ashley	1986	1,302,126	Static	—	—	—	—	—	—
	1985	778,912	—	—	—	—	—	—	—
Boise	1986	4,248	Static	1,715	Up	1,935	Up	1,095	Up
	1985	4,828	—	227	—	392	—	84	—
Bridger-Teton	1986	10,703	Down	745	Down	—	—	—	Down
	1985	18,733	—	4,500	—	—	—	226	—
Caribou	1986	4,628	Down	1,415	Up	—	—	35	Up
	1985	7,995	—	51	—	—	—	—	—
Challis	1986	2,494	Up	—	—	—	—	—	—
	1985	1,170	—	—	—	—	—	—	—
Dixie	1986	210	Static	—	—	—	—	—	—
	1985	112	—	—	—	—	—	—	—
Fishlake	1986	—	—	—	—	—	—	63	Static
	1985	—	—	—	—	—	—	49	—
Grand Teton National Park**	1986	217	Static	43	Down	—	—	56	Up
	1985*	—	—	—	—	—	—	—	—
Manti-LaSal	1986	397	Up	—	—	—	—	56	Static
	1985	269	—	—	—	—	—	35	—
Payette	1986	734	Down	301	Up	235	Up	12,600	Static
	1985	1,090	—	189	—	—	—	13,775	—
Salmon	1986	852	Up	133	Up	155	Static	63	Up
	1985	381	—	42	—	120	—	—	—
Sawtooth	1986	4,620	Up	1,202	Up	77	Up	49	Up
	1985	2,691	—	141	—	—	—	—	—
Targhee	1986	738	Static	348	Static	—	—	25	Static
	1985	483	—	484	—	—	—	—	—
Toiyabe	1986	422	Down	—	—	—	—	—	—
	1985	676	—	—	—	—	—	—	—
Uinta	1986	150	Down	—	—	—	—	42	Static
	1985	600	—	—	—	—	—	112	—
Wasatch-Cache	1986	179,490	Static	335	Up	—	—	49	Up
	1985	180,217	—	—	—	—	—	14	—
TOTAL	1986	1,512,029		6,237		2,402		14,133	
	1985	998,157		5,634		512		14,295	

* Only portions of Forests flown; actual mortality figures might be higher.
** Not surveyed in 1985.

TABLE 2. Status of mountain pine beetle infestations by state during 1986.

IDAHO

Land Ownership Class	Outbreak Area (Thousand Acres)	Number of Trees (Thousands)
National Forest	16.6	16.6
Other Federal	0.2	0.2
State and Private	1.9	1.8
TOTAL	18.7	18.6

NEVADA

National Forest	0.4	0.6
Other Federal	0	0
State and Private	0	0
TOTAL	0.4	0.6

UTAH

National Forest	548.9	1,454.2
Other Federal	3.1	8.5
State and Private	8.4	19.7
TOTAL	560.4	1,482.4

WYOMING

National Forest	6.9	9.2
Other Federal	0.8	1.1
State and Private	0.3	0.4
TOTAL	8.0	10.7

FIGURE 1. Areas infested by mountain pine beetle in Region 4 during 1986 as observed during aerial detection surveys.

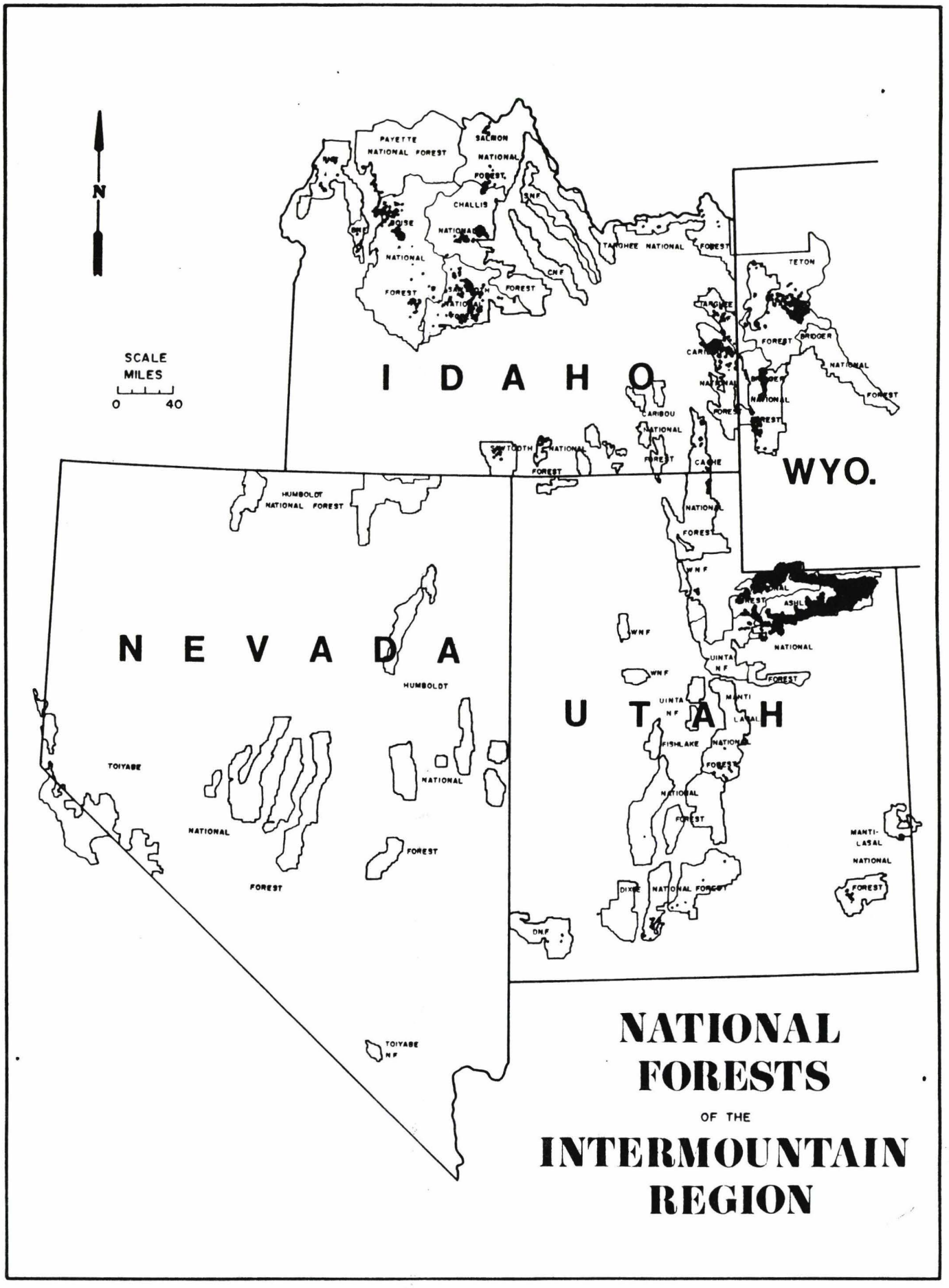
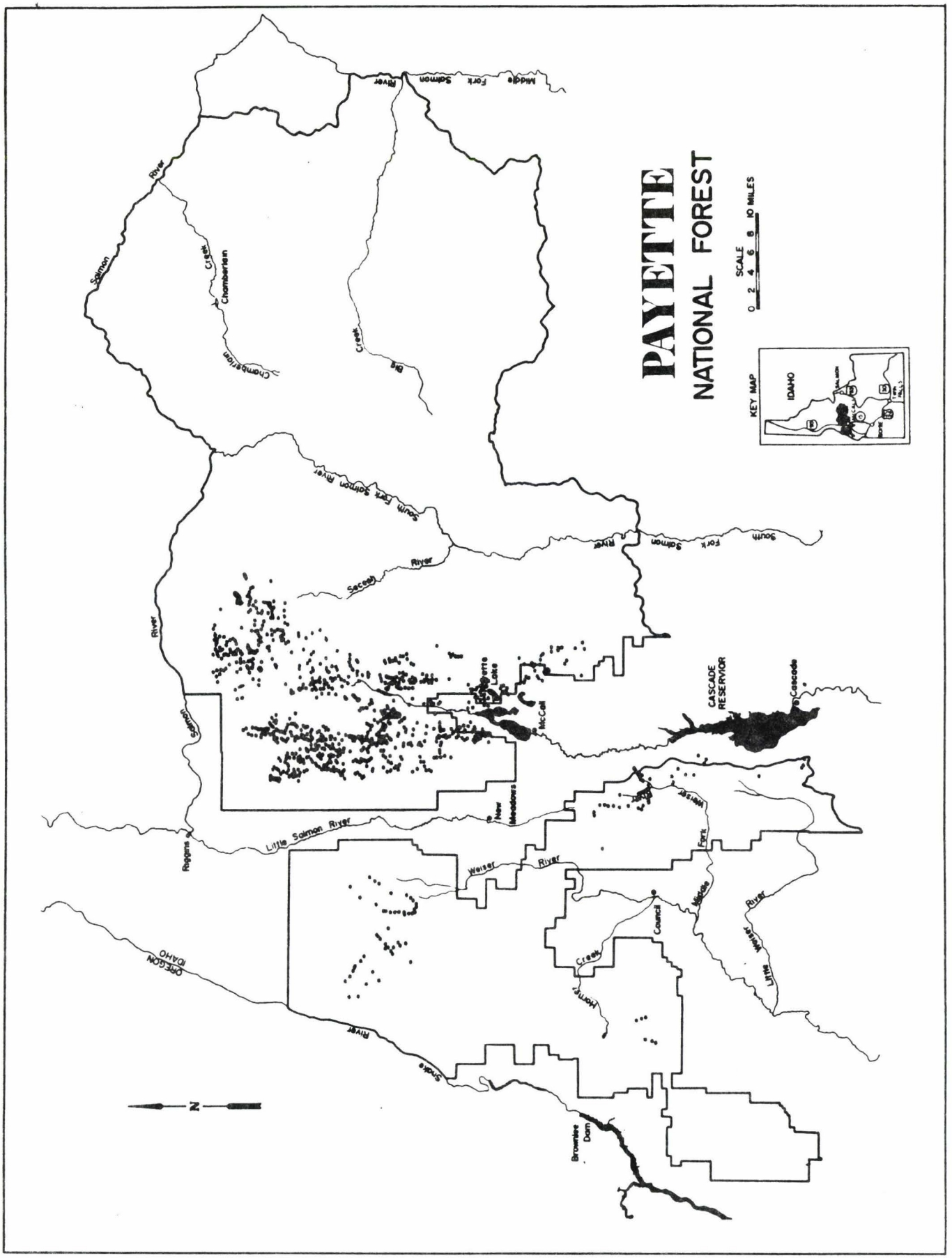


FIGURE 2. Areas infested by spruce beetle on Payette National Forest during 1986 as observed during aerial detection surveys.



DEFOLIATORS

Western Spruce Budworm, *Choristoneura occidentalis* Freeman

Conifer defoliation by western spruce budworm increased to 3.1 million acres in 1986, an increase of 230,000 acres from 1985. Defoliation continues to expand on the Boise, Payette, Caribou, Salmon, and Sawtooth National Forests in southern Idaho, and on the Dixie and Wasatch-Cache National Forests in Utah. Defoliation decreased on the Challis and Targhee National Forests in southern Idaho, and on the Fishlake National Forest in Utah and Bridger-Teton National Forest in western Wyoming.

The acres infested by National Forest are displayed in Table 3. The status of the infestations by State is shown in Table 4. Locations of major infestations in the Region are depicted in Figure 3.

Sugar Pine Tortrix, *Choristoneura lambertiana* (Busck); and Pine Needle Sheathminer, *Zelleria haimbachi* Busck

Isolated infestations continue in lodgepole pine on the Targhee National Forest in eastern Idaho, and the Bridger-Teton National Forest in western Wyoming.

Douglas-Fir Tussock Moth, *Orgyia pseudotsugata* (McDunnough)

No defoliation was observed in southern Idaho during aerial detection surveys.

Pheromone baited detection traps were placed in the Boise, Payette, and Sawtooth National Forests, State of Idaho and Bureau of Land Management lands near Bellevue, Idaho, and in the Owhyee Mountains of southwestern Idaho. Survey results indicate increasing populations on the Payette National Forest and in the Owhyee Mountains.

Gypsy Moth, *Lymantria dispar* (L.)

No gypsy moths were found during detection surveys using pheromone baited traps. Fifty-one developed sites were monitored in southern Idaho in cooperation with the Idaho Department of Agriculture and the Idaho Department of Lands.

MISCELLANEOUS INSECTS

Locust borer, *Megacyllene robiniae* (Forster)

The locust borer continues to kill black locust that line ditch banks and canals in Boise, Idaho. The borer killed 450 trees in 1986 of a total 1,800 city-owned black locust.

Scarab Beetle, *Dichelonyx ?backi?*

Scattered defoliation on new growth caused by a scarab beetle, identified as *Dichelonyx backi,* was observed in lodgepole pine on the Targhee National Forest. Defoliation was most evident on young stands but feeding was also detected on mature trees.

Spruce Bud Scale, *Physokermes piceae* (Schrank)

Infestations of spruce bud scale were detected on ornamental spruce, especially Norway spruce, in southern Idaho.

TABLE 3. Acres of defoliation by western spruce budworm in the Intermountain Region during 1985-1986 as observed during aerial detection surveys.

Forest (& Adjacent Land)*	Year	Defoliation Intensity				Change (From 1985)
		Light	Moderate	Heavy	Total	
Boise	1986	76,875	302,216	754,614	1,133,705	+ 151,804
	1985	101,236	403,835	476,830	981,901	
Bridger-Teton	1986	98,410	12,723	584	111,717	– 86,814
	1985	183,517	15,014	0	198,531	
Caribou	1986	47,018	141,105	88,795	276,918	+ 91,764
	1985	0	61,035	124,119	185,154	
Challis	1986	32,571	2,258	0	34,829	– 65,399
	1985	46,374	39,951	13,903	100,228	
Dixie	1986	6,347	9,071	12,019	27,437	+ 6,333
	1985	4,277	9,077	7,750	21,104	
Fishlake	1986	5,031	0	0	5,031	– 7,244
	1985	10,911	1,364	0	12,275	
Grand Teton N.P.	1986	23,071	1,622	137	24,830	**
	1985	**	**	**	**	
Payette	1986	61,768	193,957	362,550	618,275	+ 90,635
	1985	81,195	166,105	280,340	527,640	
Salmon	1986	29,580	0	0	29,580	+ 15,191
	1985	14,389	0	0	14,389	
Sawtooth	1986	60,667	162,788	131,336	354,791	+ 19,389
	1985	25,593	122,994	186,815	335,402	
Targhee	1986	266,839	171,437	18,583	456,859	– 18,804
	1985	55,446	79,126	341,061	475,663	
Wasatch-Cache	1986	41,704	5,195	16,207	63,106	+ 8,879
	1985	9,726	28,133	16,367	54,227	
Southern Idaho totals	1986	575,318	973,761	1,355,878	2,904,957	+ 284,610
	1985	324,233	873,046	1,423,068	2,620,347	
Utah totals	1986	53,082	14,266	28,266	95,574	+ 7,969
	1985	24,914	38,574	24,117	87,605	
Wyoming totals	1986	121,481	14,345	721	136,547	– 61,984
	1985	183,517	15,014	0	198,531	
R-4 totals	1986	749,881	1,002,372	1,384,825	3,137,078	+ 230,595
	1985	532,664	926,634	1,447,185	2,906,483	

* Only portions of Forests flown; actual defoliation figures might be higher.
** Not surveyed in 1985.

TABLE 4. Status of western spruce budworm by State during 1986.

IDAHO

Land Ownership Class	Outbreak Area (Thousand Acres)
National Forest	2,727.7
Other Federal	3.4
State and Private	173.7
TOTAL	2,904.9

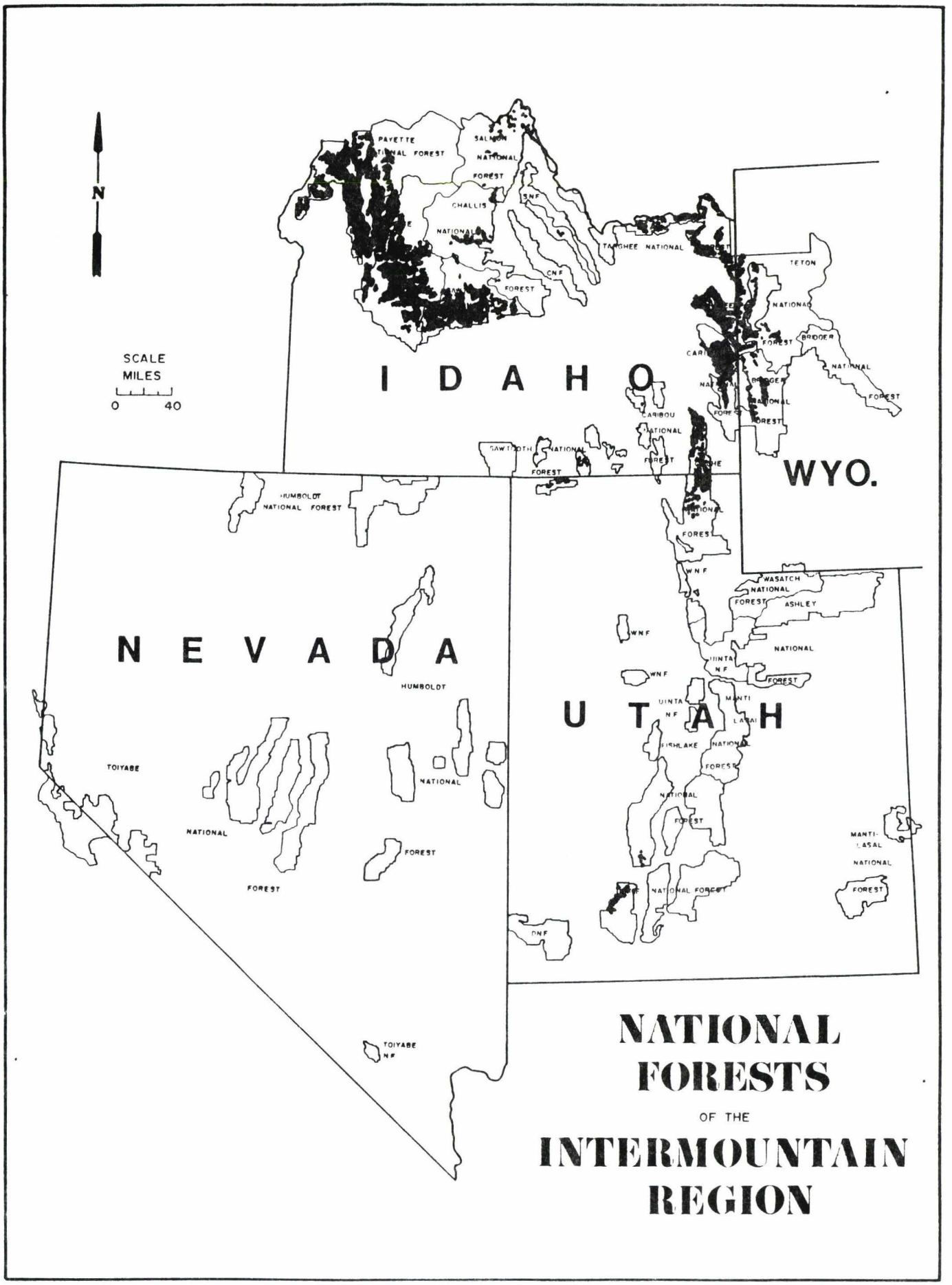
UTAH

National Forest	93.6
Other Federal	0.5
State and Private	1.5
TOTAL	95.6

WYOMING

National Forest	126.9
Other Federal	9.5
State and Private	0.1
TOTAL	136.5

FIGURE 3. Areas infested by western spruce budworm in Region 4 during 1986 as observed during aerial detection surveys.



Intermountain Region—Status of insects in southern Idaho, Nevada, Utah, and western Wyoming.

Insect	Host	Location	Remarks
Douglas-fir beetle *Dendroctonus pseudotsugae*	Douglas-fir	Idaho, Utah, Wyoming	Activity increased in 1986; 6,237 trees were killed. Group killing of Douglas-fir increased on the Boise, Caribou, and Sawtooth National Forests, ID; and on the Wasatch-Cache National Forest, UT. Mortality decreased on the Bridger-Teton National Forest, WY.
Douglas-fir tussock moth *Orgyia pseudotsugata*	Douglas-fir	Idaho	No new defoliation was observed.
Gypsy moth *Lymantria dispar*	—	Idaho	Populations were not detected by pheromone trapping in 1986.
Jeffrey pine beetle *Dendroctonus jeffreyi*	Jeffrey pine	Nevada	Minimal beetle activity was detected on the Toiyabe National Forest, NV.
Larch casebearer *Coleophora laricella*	Western larch	Idaho	Some defoliation was observed on the Payette National Forest.
Locust borer *Megacyllene robiniae*	Black locust	Idaho	Locust borer killed 450 black locust in Boise, ID.
Mountain pine beetle *Dendroctonus ponderosae*	Lodgepole pine, ponderosa pine, other pines	Idaho, Utah, Wyoming	Mountain pine beetle activity increased in the Region. Tree mortality increased from 998,157 trees in 1985 to over 1.5 million trees in 1986. Significant infestations occurred on the Boise, Caribou, and Sawtooth National Forests, ID; the Ashley and Wasatch-Cache National Forests, UT; and the Bridger-Teton National Forest, WY.
Pine butterfly *Neophasia menapia*	Ponderosa pine	Idaho	Adult moths were observed in ponderosa pine stands.
Pine engraver *Ips pini*	Pines	Idaho	A significant increase in activity was observed in southern Idaho where 2,400 trees were killed on the Boise, Payette, Salmon and Sawtooth National Forests.

Intermountain Region—Status of insects in southern Idaho, Nevada, Utah, and western Wyoming—Continued.

Insect	Host	Location	Remarks
Pine needle sheathminer *Zelleria haimbachi*	Lodgepole pine	Idaho	Defoliation by this insect and the sugar pine tortrix, was detected on the Targhee National Forest, ID.
Scarab beetle *Dichelonyx ?backi?*	Lodgepole pine	Idaho	Scattered defoliation on new growth in lodgepole stands was detected on the Targhee National Forest, ID.
Spruce beetle *Dendroctonus rufipennis*	Engelmann spruce	Idaho, Utah, Wyoming	Epidemic populations continue to cause significant mortality on the Payette National Forest, Idaho where 12,600 infested trees were detected in 1986. Smaller infestations are on the Boise National Forest, ID; the Bridger-Teton National Forest, WY; and the Uinta National Forest, UT.
Spruce bud scale *Physokermes piceae*	Spruces	Idaho	Infestations of spruce bud scale were detected on ornamental spruce scattered throughout southern Idaho.
Sugar pine tortrix *Choristoneura lambertiana*	Pines	Idaho, Wyoming	This insect continues to cause scattered defoliation of lodgepole and ponderosa pines.
Western pine beetle *Dendroctonus brevicomis*	Ponderosa pine	Idaho	Tree mortality caused by a complex of bark beetles including the western pine beetle was detected on the Boise National Forest, ID.
Western pineshoot borer *Eucosma sonomana*	Ponderosa pine	Idaho	Scattered infestations were observed.
Western spruce budworm *Choristoneura occidentalis*	Douglas-fir, spruce, true firs western larch	Idaho, Utah, Wyoming	Conifers on about 3.1 million acres were defoliated in 1986, compared to 2.9 million acres in 1985. Infestations expanded on the Boise, Caribou, Payette, Salmon and Sawtooth National Forests, ID; and on the Dixie and Wasatch-Cache National Forests, UT. Defoliation decreased on the Bridger-Teton, Challis, Fishlake and Targhee National Forests.

STEM AND BRANCH DISEASES

Dwarf Mistletoes, *Arceuthobium spp.*

Dwarf mistletoe management considerations are incorporated into long-range plans and silvicultural prescriptions for timber management. Concurrently, dwarf mistletoe suppression projects are funded by Forest Pest Management to "clean up" a diminishing acreage of previously harvested stands in which infected trees were not removed and now overtop established regeneration. The goal of the Regional program is to implement suppression strategies as part of ongoing forest management activities; gradually decreasing reliance on the suppression funding program.

The dwarf mistletoe management program in Region 4 is a sequential process of education, detection and evaluation, pre-suppression survey, suppression and post-suppression evaluation. Accomplishments for 1986 are reported in Table 5.

TABLE 5. Dwarf mistletoe accomplishments - Region 4, 1986.

National Forest	Pre-suppression Survey Acres	Suppression Project Acres	Post-Suppression Evaluation Acres
Ashley	0	280	0
Boise	44,872	509	300
Bridger-Teton	2,500	200	300
Caribou	12,000	210	250
Challis	1,667	32	58
Dixie	0	500	0
Fishlake	1,000	30	0
Manti-LaSal	60	45	30
Payette	20,204	254	641
Salmon	13,783	133	0
Sawtooth	77	78	78
Targhee	753	1,293	430
Toiyabe	0	25	0
Wasatch-Cache	200	200	0
TOTAL	97,116	3,789	2,087

Douglas-fir dwarf mistletoe was reported for the first time in the Owyhee Mountains, one mile north of Silver City in southwestern Idaho.

Pinyon Blister Rust, *Cronartium occidentale* Hedgc., Bethel & Hunt

This blister rust causes a stem canker and was reported for the first time on pinyon pine in Idaho in the Albion Mountains north of the Idaho/Utah border.

Thyronectria Canker, *Thyronectria* sp.

The first case of this canker disease of honeylocust in the state of Utah was detected in Salt Lake City by Dr. Sherman V. Thomson of the Utah State University Extension Service. This fungus kills urban honeylocust trees along the Front Range of Colorado.

ROOT DISEASES

Annosus Root Disease, *Heterobasidion annosum* (Fr.) Bref.

This fungus becomes established in new areas by invading freshly exposed wounds and stumps. Seedling, sapling, and pole-size pines are killed by the fungus. Douglas-fir seedlings and saplings are occasionally killed. The fungus causes a root and butt rot of true firs and spruce and occasional mortality.

Armillaria Root Disease, *Armillaria obscura* (Secr.)Herink

A study was initiated in cooperation with the Intermountain Forest and Range Experiment Station to determine the species of *Armillaria* on conifers in Utah. Diploid isolates, previously identified as *A. mellea,* were paired with haploid isolates of known *Armillaria* spp. to determine correct taxonomic position. Preliminary results indicate that *Armillaria obscura,* a pathogenic species of *Armillaria,* occurs on living and mountain pine beetle-killed lodgepole pines on the Wasatch-Cache National Forest, living Engelmann spruce and dead subalpine fir on the Manti-LaSal National Forest, and stumps of Engelmann spruce harvested 20 years previously on the Dixie National Forest.

A ground survey of a spruce-fir stand on the Manti-LaSal National Forest revealed extensive infection by *A. obscura.* Thirty-six percent of the area was found to be infested with the fungus. The pattern of infection varied from scattered individual trees to large infection centers up to 600 feet in diameter. Many of the dead and downed trees also showed signs of infestation by spruce beetle, *Dendroctonus rufipennis.*

Black Stain Root Disease, *Verticicladiella wageneri* Kend.

A dark-brown to black-colored sapwood stain caused by *Verticicladiella wageneri* was found on roots and butts of dead and dying pinyon pine near Almo, Idaho. Mortality often occurred in expanding disease centers. The extent of the infection centers is being determined through use of color-infrared, low level photography.

Tomentosus Root Disease, *Inonotus tomentosus* (Fr.) Gilbn.

The fungus is frequently detected as a root/butt rot of pole-size and larger Douglas-fir in southern Idaho. It is occasionally detected on Engelmann spruce and subalpine fir. Infection seldom causes direct mortality, except when the fungus kills suppressed Douglas-fir seedlings. Infection predisposes trees to windthrow and bark beetle attack.

In Utah, the fungus causes a root/butt rot of mature Engelmann spruce on the Manti-LaSal National Forest, and lodgepole pine on the Wasatch-Cache National Forest. Infection often results in mortality of Engelmann and blue spruce on the Aquarius Plateau, Dixie National Forest.

Schweinitzii Butt Rot, *Phaeolus schweinitzii* (Fr.) Pat.

Douglas-fir in southern Idaho can be infected by the red-brown butt rot fungus. The fungus is associated with other root pathogens, primarily *Inonotus tomentosus*. Infection can kill Douglas-fir seedlings, but usually predisposes the tree to windthrow or bark beetle attack.

FOLIAGE DISEASES

Douglas-fir Needle Cast, *Rhabdocline* sp.

Douglas-fir needle cast can be difficult to detect because infections often occur in Douglas-fir stands that are defoliated by the western spruce budworm. The combined defoliating effects of the pests cause mortality of seedling and sapling-sized trees in north-central and eastern Idaho.

Marssonina blight, *Marssonina populi* (Lib.) Magn.

The disease infects aspen foliage throughout the host range in southern Idaho and northern Utah.

VASCULAR WILTS

Dutch Elm Disease, *Ceratocystis ulmi* (Buism.) C. Mor.

The city of Boise, Idaho has a street-tree population of about 2,100 elm trees. In 1986, 30 trees were killed by dutch elm disease. The city plans to replace the elms with trees requiring less maintenance. In Utah, the disease was found for the first time in the city of Logan. Mortality of American elms continues in communities along the Wasatch Front in Utah.

ABIOTIC

Hail Damage

A severe, spring hailstorm stripped the foliage and buds from the southeast side of a 200-acre Douglas-fir stand in the Brownlee Creek drainage, 15 miles northwest of Cambridge, ID.

Snow Damage

A wet and heavy snowfall in February 1986 caused extensive tree damage throughout western Wyoming and northern Utah. Large avalanches uprooted and broke mature and over-mature Engelmann spruce, subalpine fir, and Douglas-fir on the Wasatch-Cache and Uinta National Forests. Leaders were bent and broken on many 4 to 6 foot tall lodgepole pine on the Bridger-Teton National Forest.

Intermountain Region—Status of diseases in southern Idaho, Nevada, Utah, and western Wyoming

Disease	Host	Location	Remarks
STEM AND BRANCH DISEASES			
Aspen trunk rot *Phellinus tremulae*	Aspen	Idaho, Nevada, Utah, Wyoming	Decay occurs in most aspen stands in the Region.
Comandra blister rust *Cronartium comandrae*	Lodgepole pine, ponderosa pine	Idaho, Utah, Wyoming	Infections occur infrequently on lodgepole pine. Infections on ponderosa pine are found infrequently and only on planted stock in southern Idaho.
Dwarf mistletoes *Arceuthobium* spp.	Douglas-fir, lodgepole pine, ponderosa pine, western larch	Idaho, Nevada, Utah, Wyoming	These continue to be the most frequently observed pests in the Region. Suppression projects removed infected overstory trees from 3,789 acres.
Pinyon blister rust *Cronartium occidentale*	Singleleaf pinyon	Idaho, Nevada	Blister rust of pinyon was reported for the first time in the Albion Mtns., ID, six miles north of the Utah border.
Red ring rot *Phellinus pini*	Western larch, Douglas-fir, true firs, pines, spruce	Idaho, Utah, Wyoming	This fungus occurs in stands of mature conifers. Infection intensity is varied.
Rust-red stringy rot *Echinodontium tinctorium*	Grand fir, white fir, subalpine fir	Idaho, Nevada	Decay caused by this fungus is common in mature and overmature true firs.
Stalactiform blister rust *Cronartium coleosporioides*	Lodgepole pine	Idaho, Utah Wyoming	This rust occurs in localized areas of host type across the Region. Heavy infection levels occur in several areas.
Thyronectria canker *Thyronectria* sp	Honeylocust	Utah	This fungus was found for the first time on honeylocust in Salt Lake City by the Utah State University Extension Service.
Western gall rust *Endocronartium harknessii*	Lodgepole pine, ponderosa pine	Idaho, Utah, Wyoming	Gall rust occurs throughout host types. Infestion levels vary by site.

Intermountain Region—Status of diseases in southern Idaho, Nevada, Utah, and western Wyoming—Continued

Disease	Host	Location	Remarks
ROOT DISEASES			
Annosus root disease *Heterobasidion annosum*	Douglas-fir, lodgepole pine, ponderosa pine, true firs	Idaho, Nevada, Utah, Wyoming	This fungus occurs as a root and butt rot of true firs. It can kill young ponderosa pine, and can predispose lodgepole pine and Douglas-fir to windthrow and bark beetle attack.
Armillaria root disease *Armillaria* spp.	Douglas-fir, grand fir, pines, spruce	Idaho, Utah, Wyoming	In southern Idaho, *Armillaria* functions as a weak pathogen. In Utah, *Armillaria obscura* was identified on lodgepole pine, Engelmann spruce, and subalpine fir.
Black stain root disease *Verticicladiella wageneri*	Pinyon pine	Idaho, Nevada, Utah	Pinyon pine mortality caused by black stain root disease is occurring in progressively expanding disease centers near Almo, ID.
Schweinitzii butt rot *Phaeolus schweinitzii*	Douglas-fir, ponderosa pine	Idaho	Decay is common in mature and overmature forests, especially those with a recent fire or logging history. The fungus is often found associated with other root diseases and bark beetles.
Tomentosus root disease *Inonotus tomentosus*	Douglas-fir, spruce, subalpine fir, lodgepole pine	Idaho, Utah	The fungus is commonly found with *P. schweinitzii* as a root/butt rot of pole-size and larger Douglas-fir and spruce less often in subalpine fir in Idaho. Infection can cause tree mortality. In Utah, this disease was detected on Engelmann spruce on the Manti-LaSal National Forest, and on lodgepole pine on the Wasatch-Cache National Forest.
FOLIAGE DISEASES			
Douglas-fir needlecast *Rhabdocline* spp.	Douglas-fir	Idaho	Infection, in conjunction with western spruce budworm feeding, continues to cause defoliation and mortality of all size-classes of the host in central and eastern Idaho.

Intermountain Region—Status of diseases in southern Idaho, Nevada, Utah, and western Wyoming—Continued

Disease	Host	Location	Remarks
Elytroderma disease *Elytroderma deformans*	Ponderosa pine	Idaho	High levels of infection continue throughout the host type, especially in stands around Cascade, ID.
Fir broom rust *Melampsorella caryophyllacearum*	Subalpine fir	Idaho, Utah, Wyoming	Infection is scattered in the host type. High incidence and infection levels have historically been observed.
Fir needle cast *Lirula* spp.	Subalpine fir, grand fir	Idaho	Infected stands were found on the Council and Weiser Ranger Districts of the Payette National Forest.
Larch needle cast *Meria laricis*	Western larch	Idaho	Incidence and severity of infection was at a low level.
Marssonina blight *Marssonina populi*	Aspen	Idaho, Utah, Wyoming	Scattered incidence of light-to-moderate intensity was observed for the Region.
Spruce broom rust *Chrysomyxa arctostaphyli*	Engelmann spruce	Idaho, Utah, Wyoming	Infection occurs scattered in the Region. It is common in the drainages west of Bear Lake in eastern Idaho.
VASCULAR WILTS			
Dutch elm disease *Ceratocystis ulmi*	*Ulmus* spp.	Idaho, Utah	Thirty trees were infected from a population of 2,100 elms surveyed along the city streets in Boise, ID. In Logan, Utah this disease was found for the first time. Mortality of native elms continued throughout Utah, however, losses are not great due to the small host population.
ABIOTIC			
Hail damage	Douglas-fir	Idaho	Hail from an early spring storm stripped the foliage from a 200-acre Douglas-fir stand 15 miles northwest of Cambridge, ID.
Snow damage	Engelmann spruce, subalpine fir, lodgepole pine	Utah, Wyoming	Abnormally wet and heavy snowfall in Utah led to avalanches that caused uprooting and breakage of spruce and fir and bending of lodgepole pine terminals in Wyoming.

RECENT PUBLICATIONS

Anhold, J.A. Mountain pine beetle infestation, Greys River Ranger District, Bridger-Teton National Forest 1985. FPM Report 86-9. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 11p.

Anhold, J.A. Western spruce budworm egg mass, Sunrise Campground survey on the Logan Ranger District, Wasatch-Cache NF. FPM Report 86-10. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 6p.

Anhold, J.A. Mountain pine beetle pheromone trapping, Roosevelt Ranger District, Ashley National Forest 1985. FPM Report 86-11. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 10p.

Anhold, J.A. Douglas-fir beetle, Davis Hill, Buffalo Ranger District, Bridger-Teton National Forest 1985. FPM Report 86-12. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 6p.

Anhold, J.A. Mountain pine beetle, campground spray evaluation, Wasatch-Cache and Ashley National Forests. FPM Report 86-14. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 7p.

Anhold, J.A. Spruce beetle survey in Big Cottonwood Canyon, Salt Lake Ranger District, Wasatch-Cache National Forest. FPM Report 86-16. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 9p.

Hoffman, J.T.; Marshall, J.P. Pest damage survey of four ponderosa pine progeny test areas in southern Idaho. FPM Report 86-18. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 6p.

Holland, D.G. The role of forest insects and diseases in the Yellowstone ecosystem. Western Wildlands 12(3): 19-23. 1986.

Keysor, A.M. Evaluation of pest conditions, Kaler and Dodds Hollows, Vernal Ranger District, Ashley National Forest. FPM Report 86-2. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 7p.

Keysor, A.M. Evaluation of pest conditions, Old Lilly Lake Burn, Evanston Ranger District, Wasatch-Cache National Forest. FPM Report 86-3. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 6p.

Keysor, A.M. Evaluation of pest conditions, North Fork Provo River and Broadhead Meadows, Kamas Ranger District, Wasatch-Cache National Forest. FPM Report 86-7. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 6p.

Keysor, A.M.; Kalafarski, J.T. Post-Control Evaluation, LaBarge Creek Drainage, dwarf mistletoe control project, Kemmerer Ranger District, Bridger-Teton National Forest. FPM Report 86-15. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 3p.

Keysor, A.M. An evaluation of proposed dwarf mistletoe control projects, Greys River Ranger District, Bridger-Teton National Forest. FPM Report 86-17. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 7p.

Knapp, K.A.; Mocettini, P.J.; Cahill, D.B. The 1985 western spruce budworm conditions in southern Idaho and predictions for 1986. FPM Report 86-13. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 15p.

Marsden, M.A.; Cahill, D.B.; Knapp, K.A.; Beveridge, R.L. Susceptibility of stands to defoliation by western spruce budworm on the Payette National Forest, Idaho. FPM Report No. 86-8. Fort Collins, CO: USDA Forest Service, Methods Application Group; 1986. 15p.

Marshall, J.P. Pre- and post-fumigation soil assays of fungal populations relative to three fumigation treatments, Lucky Peak Nursery. FPM Report 86-6. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 4p.

Martin, N.E.; Williams, R.E. Using aerial photos to fingerprint a stand for root disease research. Res. Note INT-360: Ogden, UT. Intermountain Research Station; 1986. 3p.

Thier, R.W. Pine butterfly populations on the Boise and Payette National Forests 1985. FPM Report 86-1. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 7p.

Thier, R.W. Operational use of systemic insecticide implants to suppress western spruce bud worm in Douglas-fir cones in Idaho. FPM Report 86-4. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 8p.

Thier, R.W. Douglas-fir tussock moth monitoring in southern Idaho in 1984 and 1985. FPM Report 86-5. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 5p.

Tkacz, B.M. Evaluation of pest conditions, Indian Creek Recreation Lands, Carson City District, Bureau of Land Management. FPM Report 86-8. Ogden, UT: USDA Forest Service, Intermountain Region; 1986. 10p.

Tkacz, B.M.; Schmitz, R.F. Association of an endemic mountain pine beetle population with lodgepole pine infected by Armillaria root disease in Utah. Research Note INT-353. Ogden, UT: USDA Forest Service, Intermountain Research Station; 1986. 7p.

Weatherby, J.C.; Wallace, H.N.; Kraatz, C.L. Post-treatment evaluation of the 1985 pest management program in the Mississippi slash seed source at the Erambert Seed Orchard, Brooklyn, Mississippi. FPM Report 86-2-11. Atlanta, GA: USDA Forest Service, Southern Region; 1986. 18p.

Weatherby, J.C.; Wallace, H.N.; Kraatz, C.L. Post-treatment evaluation of the 1985 pest management program at the Ouachita Seed Orchard, Mt. Ida, Arkansas. FPM Report 86-2-12. Atlanta, GA: USDA Forest Service, Southern Region; 1986. 17p.

Weatherby, J.C.; Wallace, H.N.; Kraatz, C.L. Post-treatment evaluation of the 1985 pest management program in the Alabama loblolly seed source at the Erambert Seed Orchard, Brooklyn, Mississippi. FPM Report 86-2-14. Atlanta, GA: USDA Forest Service, Southern Region; 1986. 18p.

Williams, R.E.; Shaw, C.G.; Wargo, P.M.; Sites, W.H. Armillaria root disease. Forest Insect and Disease Leaflet 78. USDA Forest Service; 1986. 8p.